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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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24325	7590	04/10/2006	EXAMINER	
STEPHEN D. SCANLON JONES DAY 901 LAKESIDE AVENUE CLEVELAND, OH 44114			GHEBRETINSAE, TEMESGHEN	
			ART UNIT	PAPER NUMBER
			2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. Claims 5, 39, 63, and ~~84~~⁸¹ are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Review of these method claims in view of interim guidelines does not reveal a practical application for these claims. While claims disclose the determination / calculation of symbol phase, there is no further use for this operation claimed that would render a tangible result for the symbol phase determination, and therefore it is held these claims are non-statutory.

Response to Arguments

2. Applicant's arguments filed 12/28/05 have been fully considered but they are not persuasive.

With regard to applicant's argument regarding oversampling and correlation. First, review of previously cited art, in examiner's opinion, indicates that correlation function and sampling ratio are linked and that an increase in sampling ration provides a higher resolution result. Examiner further notes that a variety of oversampling rates have been disclosed in the literature (2x (minimum), 4x, 8x, etc.) and, that correlation functions are understood to be related to sampling rates by virtue of their operation. Review of applicant's specification does not state that this is a particular problem being solved by virtue of the 5 point correlation function claimed by applicant, and therefore it appears that this 5 point correlation function is a design choice in view of known use of oversampling and correlation functions.

3. Restatement of previous rejections.

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Claims 5, 23, 39, 50, and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huber et al (US-6,618,452) in view of Fechtel et al (Efficient FFT and equalizer implementation for OFDM receivers; Consumer Electronics, IEEE Transactions on Volume 45, Issue 4, Nov 1999 Page(s):1104 – 1107) in further view of Sayeed (US-6,456,653).

With regard to claim 5, Huber discloses a method of processing burst information in a transmission link, comprising the steps of: receiving a sampled waveform containing a record of symbols imposed on a carrier signal (see column 3, lines 44 – 50 and figure 5A, 503), determining symbol phase of record of symbols utilizing one or more metrics (see column 10, lines 4 – 12 and figure 5A), calculating phase ambiguity of the burst information (see column 10, lines 4 – 12); and indexing an arrival time of the burst information (see column 3, lines 54 – 59). Huber is silent with respect to location of down conversion in his system. Fechtel discloses a receiver carrier and timing synchronization processing occurring prior to down conversion (see figure 1). It would have been obvious to one of ordinary skill in the art at the time of invention to perform to utilize this architecture as Fechtel discloses this as a typical receiver configuration (see Section 1, 2nd paragraph). Huber discloses the use of trigonometric functions for correlation (see column 16, MMSE Criterion Section where equations shown are transforms of trigonometric functions). Huber is silent with respect to sampling rate (5-point correlation) of his system. Sayeed discloses means for determining sampling rate requirements (see column 3, lines 12 – 36). Based on Sayeed's disclosure, it is deemed that the sampling rate is a design choice dictated by system characteristics in lieu of a clear statement regarding the necessity of 5 times oversampling.

With regard to claim 23, the functions of the apparatus are an embodiment of the method of Huber as discussed in claim 5, and therefore would have been obvious in view of the aforementioned rejection of claim 5.

With regard to claim 39, Huber discloses a method of processing burst information in a transmission link, comprising the steps of: receiving a sampled waveform containing a record of symbols imposed on a carrier signal (see column 3, lines 44 – 50 and figure 5A, 503), determining

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symbol phase of record of symbols utilizing one or more metrics (see column 10, lines 4 – 12 and figure 5A), processing sample waveform to remove carrier signal (see column 3, lines 13 – 30) by: estimating residual carrier phase and frequency (see column 6, lines 44 – 51); and determining phase ambiguity and burst arrival time by detecting a unique pattern of symbol words in record of symbols (see column 3, lines 44 – 59) ; calculating phase ambiguity of the burst information (see column 10, lines 4 – 12); and indexing an arrival time of the burst information (see column 3, lines 54 – 59), wherein the step of processing further comprises a step of computing a FFT on a fixed block of symbols of record (see figure 26, 501 and column 13, lines 25 – 37). Huber is silent with respect to removal of carrier signal. Fechtel discloses a receiver carrier and timing synchronization processing occurring prior to down conversion (see figure 1). It would have been obvious to one of ordinary skill in the art at the time of invention to perform to utilize this architecture as Fechtel discloses this as a typical receiver configuration (see Section 1, 2nd paragraph). Huber discloses the use of trigonometric functions for correlation (see column 16, MMSE Criterion Section where equations shown are transforms of trigonometric functions). Huber is silent with respect to sampling rate (5-point correlation) of his system. Sayeed discloses means for determining sampling rate requirements (see column 3, lines 12 – 36). Based on Sayeed's disclosure, it is deemed that the sampling rate is a design choice dictated by system characteristics in lieu of a clear statement regarding the necessity of 5 times oversampling.

With regard to claim 50, Huber discloses a method of processing burst information in a transmission link, comprising the steps of: a waveform sampler for sampling a received waveform imposed on a carrier signal, sampled waveform having a record of symbols (see column 3, lines 44 – 50 and figure 5A, 503), a determinator for determining symbol phase of record of symbols utilizing one or more metrics (see column 10, lines 4 – 12 and figure 5A, 505), a resolver for resolving phase ambiguity of the burst information (see column 10, lines 4 – 12 and figure 26, 1st stage processing); a detector for detecting a time of arrival of the burst information (see column 3, lines 54 – 59 and figure 26, 509), an estimator for estimating the phase and frequency of a residual carrier of carrier signal prior to removal of carrier signal (see figure 26 and column 45, lines 25 – 42). Huber is silent with respect to

carrier removal. Fechtel discloses a receiver with carrier removal (see figure 1, I/Q Mix). It would have been obvious to one of ordinary skill in the art at the time of invention to perform to utilize this architecture as Fechtel discloses this as a typical receiver configuration (see Section 1, 2nd paragraph). Huber discloses the use of trigonometric functions for correlation (see column 16, MMSE Criterion Section where equations shown are transforms of trigonometric functions). Huber is silent with respect to sampling rate (5-point correlation) of his system. Sayeed discloses means for determining sampling rate requirements (see column 3, lines 12 – 36). Based on Sayeed's disclosure, it is deemed that the sampling rate is a design choice dictated by system characteristics in lieu of a clear statement regarding the necessity of 5 times oversampling.

With regard to claim 63, Huber discloses a method of processing burst information in a transmission link, comprising the steps of: receiving a sampled waveform containing a record of symbols imposed on a carrier signal (see column 3, lines 44 – 50 and figure 5A, 503), determining symbol phase of record of symbols utilizing one or more metrics (see column 10, lines 4 – 12 and figure 5A), processing sample waveform to in phase and frequency to remove carrier signal (see column 3, lines 13 – 30); calculating phase ambiguity of the burst information (see column 10, lines 4 – 12); and indexing an arrival time of the burst information (see column 3, lines 54 – 59), wherein the phase and frequency of a residual carrier of carrier signal is estimated in step of processing prior to removal of carrier signal and prior to a step of down converting to remove residual carrier (see figure 26 and column 45, lines 25 – 42). Huber is silent with respect to removal of carrier signal. Fechtel discloses a receiver carrier and timing synchronization processing occurring prior to down conversion (see figure 1). It would have been obvious to one of ordinary skill in the art at the time of invention to perform to utilize this architecture as Fechtel discloses this as a typical receiver configuration (see Section 1, 2nd paragraph). Huber discloses the use of trigonometric functions for correlation (see column 16, MMSE Criterion Section where equations shown are transforms of trigonometric functions). Huber is silent with respect to sampling rate (5-point correlation) of his system. Sayeed discloses means for determining sampling rate requirements (see column 3, lines 12 – 36). Based on Sayeed's

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disclosure, it is deemed that the sampling rate is a design choice dictated by system characteristics in lieu of a clear statement regarding the necessity of 5 times oversampling.

Claim 81 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huber et al ('452) in view of Fechtel in further view of Sayeed ('653) in further view of GSM TDMA Standard.

With regard to claim 81, Huber discloses a method of processing burst information in a transmission link, comprising the steps of: receiving a sampled waveform containing a record of symbols imposed on a carrier signal (see column 3, lines 44 – 50 and figure 5A, 503), determining symbol phase of record of symbols utilizing one or more metrics (see column 10, lines 4 – 12 and figure 5A); calculating phase ambiguity (see column 10, lines 4 – 12) and arrival time (see column 3, lines 54 – 59) of the burst information. Huber is silent with respect to removal of carrier signal. Fechtel discloses a receiver carrier and timing synchronization processing occurring prior to down conversion (see figure 1). It would have been obvious to one of ordinary skill in the art at the time of invention to perform to utilize this architecture as Fechtel discloses this as a typical receiver configuration (see Section 1, 2nd paragraph). Huber is silent with respect to sampling rate (5-point correlation) of his system. Sayeed discloses means for determining sampling rate requirements (see column 3, lines 12 – 36). Based on Sayeed's disclosure, it is deemed that the sampling rate is a design choice dictated by system characteristics in lieu of a clear statement regarding the necessity of 5 times oversampling. Huber discloses a variation of preamble detection. GSM TDMA standard specifies a mid-amble training sequence. It therefore would have been obvious to one of ordinary skill in the art to utilize a mid-amble training sequence as this is a known form of training sequence useful for synchronization.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Meek whose telephone number is (571)272-3013. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571)272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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